REMARKS

The examiner is thanked for thoroughly reviewing the subject patent application. All claims are now believed to be in allowable condition.

Reconsideration of the rejection of Claims 1,2,6-12 and16-19 under 35 U.S.C.103(a), as being unpatentable over Kida, U.S. Patent 6,313,540, is requested, based on the following argument.

Applicant's patent is based on the requirement for trenches to be in a mesh pattern, in which vertical and horizontal trenches do not completely intersect, so that not only is cracking of the IMD far less likely to occur but even if a crack is initiated it is confined to a single cell. This provides for a significant reliability improvement. The limitation that excludes completely crossing trenches conforms to the finding by Applicants that void formation occurs to an intolerable degree for completely crossing trenches.

Kida uses large area via holes to restrict insulator layer cracking, requiring that at least one via hole per pad have an area that is at least 3% of the pad area. No other requirements are specified concerning restriction of insulator cracking. Neither the shape of the via holes, or the shape of the via hole openings, which are the shapes given in Kida's Fig. 7, are assigned any relevance by Kida to restriction of insulator layer cracking. Kida does not make any statements at all

concerning crack propagation or void formation, neither in the claims, the specifications nor in the abstract. There, therefore, is no motivation for a mesh pattern structure for Kida's via holes. In fact, only the completely crossing pattern of Fig. 7c can be considered to be a mesh pattern and is effective in limiting crack propagation. Fig. 7a represents a system of isolated via holes arranged in rows and columns and which allow extensive crack propagation. Fig. 7b allows horizontal crack propagation. In Figs.7d and 7e extensive crack propagation is possible since crack propagation is impeded only by the completely crossing via holes. In the pattern of Fig. 7f essentially horizontal crack propagation can occur in the insulating film under the top horizontal via hole and long cracks can be propagated in the loner horizontal and vertical sections. In Fig. 7g extensive essentially horizontal crack propagation is possible and in Fig. 7h, although crack propagation is impeded along one diagonal direction there is no impediment in the other diagonal direction. As there is no mention of void formation, there is also no motivation to exclude completely crossing via hole patterns. In fact, Figs. 7c, 7d and 7e actually contain completely crossing via holes. It is thus seen that none of the patterns of Figs. 7a-7j meet the requirements of the present invention; none of them serve to sufficiently limit crack propagation and are also not prone to void formation. Furthermore there is nothing in Kida that can be construed to teach a method or to provide motivation toward a method to limit crack propagation in which the tendency of void formation at complete intersections is avoided.

Reconsideration of the rejection of Claims 1, 2, 6-9, 11,12, 16-19, 20-22 and 26-31 under 35 U.S.C. 103 (a), as being unpatentable over Kida, as applied to

Claims 1,2,6-10,12 and 16-19, in view of Huang et al., U.S. Patent 6,236,114 is requested, based on the following argument.

Applicant's patent is based on the requirement for trenches to be in a mesh pattern, in which vertical and horizontal trenches do not completely intersect, so that not only is cracking of the IMD far less likely to occur but even if a crack is initiated it is confined to a single cell. This provides for a significant reliability improvement. The limitation that excludes completely crossing trenches conforms to the finding by Applicants that void formation occurs to an intolerable degree for completely crossing trenches.

Kida uses large area via holes to restrict insulator layer cracking, requiring that at least one via hole per pad have an area that is at least 3% of the pad area. No other requirements are specified concerning restriction of insulator cracking. Neither the shape of the via holes, or the shape of the via hole openings, which are the shapes given in Kida's Fig. 7, are assigned any relevance by Kida to restriction of insulator layer cracking. Kida does not make any statements at all concerning crack propagation or void formation, neither in the claims, the specifications nor in the abstract. There, therefore, is no motivation for a mesh pattern structure for Kida's via holes. In fact, only the completely crossing pattern of Fig. 7c can be considered to be a mesh pattern and is effective in limiting crack propagation. Fig. 7a represents a system of isolated via holes arranged in rows and columns and which allow extensive crack propagation. Fig. 7b allows horizontal crack propagation. In Figs.7d and 7e extensive crack propagation is possible since crack propagation is impeded only by the completely crossing via holes. In the

pattern of Fig. 7f essentially horizontal crack propagation can occur in the insulating film under the top horizontal via hole and long cracks can be propagated in the loner horizontal and vertical sections. In Fig. 7g extensive essentially horizontal crack propagation is possible and in Fig. 7h, although crack propagation is impeded along one diagonal direction there is no impediment in the other diagonal direction. As there is no mention of void formation, there is also no motivation to exclude completely crossing via hole patterns. In fact, Figs. 7c, 7d and 7e actually contain completely crossing via holes. It is thus seen that none of the patterns of Figs. 7a-7j meet the requirements of the present invention; none of them serve to sufficiently limit crack propagation and are also not prone to void formation. Furthermore there is nothing in Kida that can be construed to teach a method or to provide motivation toward a method to limit crack propagation in which the tendency of void formation at complete intersections is avoided.

None of the applied or known references address the invention as shown in the amended claims in which a bonding pad is formed that is highly resistant to the formation of IMD cracks and in which the length of cracks that do form are limited by the cell size of a trench mesh pattern and where the trenches of the mesh pattern do not completely intersect thus avoiding a void formation exposure. The invention is believed to be patentable over the prior art cited, as it is respectfully suggested that the combination of these various references cannot be made without reference to Applicant's own invention. None of the applied references address the problem of providing a bonding pad that is resistant to IMD

crack formation and where the length of cracks that do form are so limited so as to pose no reliability problem. Furthermore, by limiting the invention so that trenches do not completely intersect problems related to void formation are avoided. Applicant has claimed his process in detail. The processes of claims 1 – 10, 11-20 and 21-31 are believed to be novel and patentable over these various references, because there is not sufficient basis for concluding that the combination of claimed elements would have been obvious to one skilled in the art. That is to say, there must be something in the prior art or line of reasoning to suggest that the combination of these various references is desirable. We believe that there is no such basis for the combination.

Reconsideration of the rejection of Claims 3 and 13 35 U.S.C. 103 (a), as being unpatentable over Kida, as applied to Claims 1,2,6-11,12 and 16-19, in view of Saran, U.S. Patent 6,232,662 is requested, based on the following argument.

Applicant's patent is based on the requirement for trenches to be in a mesh pattern, in which vertical and horizontal trenches do not completely intersect, so that not only is cracking of the IMD far less likely to occur but even if a crack is initiated it is confined to a single cell. This provides for a significant reliability improvement. The limitation that excludes completely crossing trenches conforms to the finding by Applicants that void formation occurs to an intolerable degree for completely crossing trenches.

Kida uses large area via holes to restrict insulator layer cracking, requiring that at least one via hole per pad have an area that is at least 3% of the

pad area. No other requirements are specified concerning restriction of insulator cracking. Neither the shape of the via holes, or the shape of the via hole openings, which are the shapes given in Kida's Fig. 7, are assigned any relevance by Kida to restriction of insulator layer cracking. Kida does not make any statements at all concerning crack propagation or void formation, neither in the claims, the specifications nor in the abstract. There, therefore, is no motivation for a mesh pattern structure for Kida's via holes. In fact, only the completely crossing pattern of Fig. 7c can be considered to be a mesh pattern and is effective in limiting crack propagation. Fig. 7a represents a system of isolated via holes arranged in rows and columns and which allow extensive crack propagation. Fig. 7b allows horizontal crack propagation. In Figs.7d and 7e extensive crack propagation is possible since crack propagation is impeded only by the completely crossing via holes. In the pattern of Fig. 7f essentially horizontal crack propagation can occur in the insulating film under the top horizontal via hole and long cracks can be propagated in the loner horizontal and vertical sections. In Fig. 7g extensive essentially horizontal crack propagation is possible and in Fig. 7h, although crack propagation is impeded along one diagonal direction there is no impediment in the other diagonal direction. As there is no mention of void formation, there is also no motivation to exclude completely crossing via hole patterns. In fact, Figs. 7c, 7d and 7e actually contain completely crossing via holes. It is thus seen that none of the patterns of Figs. 7a-7j meet the requirements of the present invention; none of them serve to sufficiently limit crack propagation and are also not prone to void formation. Furthermore there is nothing in Kida that can be construed to teach a method or to provide motivation toward a method to limit crack propagation in

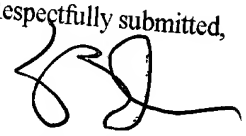
which the tendency of void formation at complete intersections is avoided.

None of the applied or known references address the invention as shown in the amended claims in which a bonding pad is formed that is highly resistant to the formation of IMD cracks and in which the length of cracks that do form are limited by the cell size of a trench mesh pattern and where the trenches of the mesh pattern do not completely intersect thus avoiding a void formation exposure. The invention is believed to be patentable over the prior art cited, as it is respectfully suggested that the combination of these various references cannot be made without reference to Applicant's own invention. None of the applied references address the problem of providing a bonding pad that is resistant to IMD crack formation and where the length of cracks that do form are so limited so as to pose no reliability problem. Furthermore, by limiting the invention so that trenches do not completely intersect problems related to void formation are avoided. Applicant has claimed his process in detail. The processes of claims 1 – 10, 11-20 and 21-31 are believed to be novel and patentable over these various references, because there is not sufficient basis for concluding that the combination of claimed elements would have been obvious to one skilled in the art. That is to say, there must be something in the prior art or line of reasoning to suggest that the combination of these various references is desirable. We believe that there is no such basis for the combination.

In summary, all claims are now believed to be in allowable condition and reconsideration of the rejections and allowance is therefore respectfully requested.

It is requested that should there be any problems with this Amendment, please call the undersigned attorney at (845) 452-5863.

Respectfully submitted,



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